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Summary

Master you mood

Online depression treatment for adolescents and young adults:
effectiveness, mechanisms of change and language use as
psychological marker

Chapter 1, the general introduction, describes the context and objectives of the study reported in this thesis. Summing up, depression is a common mental health disorder that forms a substantial burden of disease for individuals and society. To reduce the burden, early reaching, detecting and helping young people with depressive symptoms is important, as recognition of first episodes of depression (usually emerging in adolescence and young adulthood) leads to better outcome and intervening with indicated prevention appears to be cost-effective. A number of impediments to reaching young depressed people are discussed here, as well as the difficulties experienced by primary care providers in detecting subclinical to moderate depression. Regarding treatment, the lack of randomized controlled trials on online depression interventions for youth is addressed, as well as the lack of knowledge on working mechanisms of treatments and clients' processes of change. Subsequently, the Dutch online group course is introduced, known as Master Your Mood (MYM), or Grip Op Je Dip, which was designed for adolescents and young adults with depression symptoms. The opportunities raised by such online interventions to reach, detect and help young people at an early stage of depression symptoms are discussed. This chapter concludes by setting out the primary aims of the study: to evaluate the effectiveness of MYM, to identify possible circularity in change processes in MYM participants, and to study their language usage as a psychological marker to support early detection and to expand our knowledge on working mechanisms of treatment.

Chapter 2 describes the development and content of the online MYM group course and the results of our first pilot study. MYM was one of the first guided online *group* interventions in the field of e-mental health. Our pilot study assessed the feasibility of conducting a therapeutic course in a secure chatroom, the satisfaction of course leaders and participants after the course, and the efficacy of MYM in terms of reducing participants' levels of depression. The results showed that MYM had the potential to reach young depressed people and that it was technically and substantively feasible to conduct a group course in a chatroom. Course leaders and participants were generally satisfied with the intervention. Pre-post assessments of course completers indicated significant declines in depression symptoms on the Center for Epidemiologic Studies Depression Scale (CES-D; scale 0-60). A point of concern was the relatively high attrition rate before and during the course. This gave cause to reduce the number of sessions from eight to six. Altogether, the findings were encouraging, thus warranting preparation of a randomised controlled trial (RCT).

Chapter 3 presents the protocol of the randomised controlled trial we conducted on MYM, which compared an MYM intervention group with a wait-listed control group. Recruitment was carried out in the general population,

using newspaper and Internet advertisements and leaflets distributed in doctors' offices, mental health agencies and schools. Included in the sample were course participants from 16 to 25 years of age who had CES-D scores of 10 to 45 in the screening. Applicants with scores between 25 and 45 were invited to an online session to assess suicidal ideation using the MINI-Plus interview. Those exhibiting suicidal ideation and plan were excluded from the trial and referred to their general practitioner. Assessments took place prior to randomisation, 12 weeks later and 12 weeks after that. The wait-listed group received access to MYM after 12 weeks. All questionnaires were administered online. The primary outcome measure was depressive symptoms according to the CES-D; secondary measures were anxiety and mastery. The intention-to-treat principle was applied in the analyses, with missing data imputed.

Chapter 4 examines the clinical effectiveness of the MYM intervention as compared with the waiting list control condition. A total of 244 selected MYM applicants were randomised, 121 to the MYM course and 123 to the wait-listed group. In the post-treatment assessment 12 weeks after the baseline screening, the MYM group showed significantly greater improvement in depressive symptoms than the control group, with a large between-group effect size of $d = 0.94$. The MYM group also showed greater improvement in anxiety ($d = 0.49$) and mastery ($d = 0.44$). Some 56% of the MYM group and 20% of the control group showed reliable, clinically significant change. This between-group difference was significant and yielded a number-needed-to-treat value of 2.7. Improvements in the MYM group were maintained in a follow-up assessment 24 weeks after the baseline measurement. One limitation was that no 24-week comparison of the MYM and control group outcomes was feasible, as the controls had been given access to the course after their 12-week waiting period.

Chapter 5 focuses on possible circularity in the recovery processes of course participants, as had been suggested by previous research. In the full MYM sample ($N = 244$), we determined associations between anxiety and depression and between changes in them. In three mediation models, we next explored whether changes in anxiety and mastery mediated the effect of the intervention on depression, whether depression and mastery mediated the effect on anxiety, and whether depression and anxiety mediated the effect on mastery. Finally, we investigated whether early changes in anxiety or depression predicted later changes in depression or anxiety. Our analyses appeared to confirm the hypothesised circularity in the recovery process. We found high comorbidity and strong correlations between depression and anxiety. Changes in anxiety and mastery mediated change in depression (mediation proportion 44%); changes in depression mediated changes in anxiety (79%) and mastery

(75%). We did not find early anxiety change to be predictive of late depression change or vice versa, a further sign that the processes of change were circular. To expand knowledge on working mechanisms, future research should include non-specific variables in mediation models, as specific mediators such as cognitions do not explain the entire effect of CBT interventions.

Chapter 6 investigates the language usage of MYM participants in relation to their treatment outcomes and course adherence. Previous research had suggested connections between word use and mental health. The present study is the first to link word use to treatment outcomes in an RCT. This chapter focuses on the word use of 234 MYM participants on their course application forms and the predictive value of their word use for the baseline levels of depression, anxiety and mastery and their subsequent treatment adherence. We also analysed chat session transcripts of course completers ($n = 67$) to investigate whether changes in their word use during the course predicted their treatment outcomes. As hypothesised, we found that the use of the pronoun 'I' diminished from course application onwards. Depression improvement was predicted by an increasing use of discrepancy words (such as 'should', 'wish', 'hope'). Adherence was predicted by more total words, more social words and fewer discrepancy words used at application. After discussing the clinical relevance of the results, we conclude that future research on online psychological treatment should include word use analyses, as these may enhance understanding of the working mechanisms of psychological treatments.

Chapter 7 addresses the under-recognition of milder depression levels by general practitioners (GPs). Early detection of depression symptoms in young people is important to forestall the development of more serious conditions. To support early detection in primary care settings, we investigated in a mixed-method design how 414 MYM applicants to the RCT put their depressive feelings into words. This revealed that applicants' problem articulations corresponded well to the depression symptoms as defined by DSM-IV and that they also predicted their baseline CES-D levels of depression. The majority of applicants with a subclinical, moderate or high depression level according to the CES-D articulated the key symptom *depressed mood*, followed by *feelings of worthlessness and guilt*. Almost exclusive to the high-level group were expressions of *suicidal thinking* and *comorbid mental disorders*. Expressions of *depressed mood*, *insomnia or hypersomnia* and *suicidal ideation* were predictors of higher depression level; the number of symptoms articulated was not predictive. We concluded that the recognition of subclinical and major depression in young people may be improved by advising GPs to be alert not just to numbers of symptoms, but in particular to expressions of depressed

mood, insomnia or hypersomnia, suicidal ideation and comorbid mental problems.

Chapter 8 is a general discussion of the research reported in this thesis. It deals with the clinical effects of MYM, processes of change and language use as psychological marker, implications of the findings, study limitations and future research directions. The conclusion is that MYM can help to reach young people at risk of major depression, can detect their depression symptoms at an early stage, and can help them overcome those symptoms. In view of the favourable number-needed-to-treat value emerging from the RCT, MYM may help to reduce the public health burden of depression. The chapter contains several recommendations. Reaching young depressed people requires low-threshold access to treatment (as is ensured by MYM) and permanent funding for such treatments (as is supplied now by the Dutch government). Detecting depression at an early stage requires support for primary care providers in better recognising subclinical to moderate depression in young people. Our language use study provided evidence that could aid in the early detection. And optimising the effectiveness of depression treatments requires better understanding of the working mechanisms, as has been suggested in our study on mediation. Future intervention research including potential non-specific and physiological mediators may add to this knowledge, as well as research on language use as psychological marker on the wealth of data e-mental health interventions generate.